

CLAIMS

What I claim is

1. (Currently amended) An inflatable graft for placement through tortuous, narrow or stenotic cerebral blood vessels comprising:
 - a. a first outer wall of non-compliant material having a proximal end and a distal end;
 - b. a second inner wall of non-compliant material having a smaller diameter than the first outer wall and having a proximal end and a distal end;
 - c. a fluid impermeable seal of the first outer wall and the second inner wall at the distal and proximal ends;
 - d. at least two one or more fused junctures of the first and second wall, each non-inflatable fused juncture forming a circumference with a fixed diameter around the graft and not subject to inflation pressure wherein the graft can bend without kinking or distortion that are each configured as a band around the circumference of the graft and that create fluid impermeable seals and fluid communicating passages within to each resulting multiple fluid chambers between the said first and said second wall and the said multiple fused junctures;
 - e. a valve to convey fluid into the interstitial space to inflate the graft to a pre-selected shape without distortion and create a smooth inner wall lumen within the tubular graft;
 - f. a plurality of radially oriented separate and narrow non-elastic web reinforcement attached to the second inner wall and first outer wall within one or more non elastically extensible fluid chambers and further comprising tapered web reinforcement proximate to the fused junctures and causing the outer wall to taper to the fused juncture and form an acute angle to the cerebral blood vessel wall to dissipate dragging forces of flowing blood through the graft displacing the graft and to provide sites for neointimal growth [I.]]; and
 - g. the inflated first outer wall dimensioned to conform to the shape of the said cerebral blood vessel.

Claims 2 & 3 are cancelled

4. (Currently amended) The graft of claim 1 wherein the width of a fused juncture of the first outer and second inner wall is variably sized along the circumference to create a non-linear shaped longitudinal axis of the graft without kinking and distortion and the outer surface of the fused juncture anchors the graft to the inside of the blood vessel and provides a space on its outer surface for neointimal growth.
5. (Previously presented) The graft of claim 1 wherein the outer wall has a greater longitudinal length between each fused joint than the longitudinal length of the inner wall.
6. (Withdrawn) The graft of claim 1 wherein the inner and outer walls are comprised of materials having differing elasticity.
7. (Withdrawn) The graft of claim 1 wherein at least one of the inner and outer walls are comprised of non-elastic material.
8. (Previously presented) The graft of claim 1 wherein at least one wall is comprised of a material selected from a group consisting of polyethylene, polyurethane, tetrafluoroethylene, polytetrafluoroethylene and expanded polytetrafluoroethylene.
9. (Previously presented) The graft of claim 1 further comprising a fluid that can be communicated through the valve to fill the fluid chambers.
10. (Withdrawn) The graft of claim 8 further comprising a component for locating the tubular shaped graft and inflating the graft with the fluid within a vessel lumen to form a lumen within the graft through which body fluids may be conveyed.
11. (Cancelled)
12. (Withdrawn) The graft of claim 1 wherein the radially oriented web reinforcement is comprised of non-elastic material.
13. (Withdrawn) The graft of claim 1 wherein the radially oriented web reinforcement is comprised of material attached to the inner and outer walls in a corrugated manner and allowing fluid communication within the fluid chambers.
14. (Withdrawn) The graft of claim 1 wherein the material is comprised of a web of 2 or more inter-connected fibers.

15. (Currently amended) The graft of claim 12 1 wherein the radially oriented web reinforcement retains the spacing and orientation of the inner wall and relative to the outer graft wall with the addition of fluid.
16. (Previously presented) The tubular shaped graft of claim 1 having a first and second end wherein an outer diameter of the first graft end is different than the outer diameter of the second graft end.
17. (Withdrawn) The graft of claim 1 for treatment of cerebral aneurysms by placement through tortuous, narrow or stenotic cerebral blood vessels.
18. (Withdrawn) The graft of claim 1 for treatment of cerebral atherosclerosis by placement through tortuous, narrow or stenotic cerebral blood vessels.
19. (Previously presented) The graft of claim 9 wherein after the fluid chamber is filled with fluid, the outer wall forms a substantially corrugated surface and the inner wall forms a substantially smooth surface.
20. (Previously presented) The graft of claim 9 wherein the fluid is a curable composition.
21. (Previously presented) The graft of claim 20 wherein the curable composition is selected from the group consisting of a monomer, a liquid pre-polymer and an un-linked polymer.
22. (Withdrawn) A method for repair of cerebral blood vessel comprising the steps of:
 - a. inserting a sealable two walled graft for placement within the tortuous, narrow or stenotic cerebral blood vessels utilizing a catheter having a fluid conveying means in communication to a valve accessing a fluid chamber between the two walls of the graft;
 - b. maneuvering the graft to a selected location within the vessel lumen;
 - c. inserting fluid through a controllable valve within the graft and into fluid chamber between the two walls of the graft;
 - d. continuing the addition of fluid to deploy the graft in a radial direction sufficient that the one wall contacts the vessel wall and a lumen is created along the longitudinal length of the graft; and
 - e. withdrawing the catheter.

23. (Withdrawn) The method of claim 22 further comprising continuing the addition of fluid to increase the inner diameter of the graft lumen to a controlled size after the graft wall contacts the vessel wall.
24. (Withdrawn) The method of claim 22 further comprising reinforcing the wall of the vessel with the fluid inflated graft.
25. (Withdrawn) The method of claim 24 further comprising reinforcing the vessel wall with the fluid stiffened graft wall.
26. (Withdrawn) The method of claim 22 further comprising using the inflated graft to isolate a diseased vessel wall from the vessel lumen.
27. (Withdrawn) The method of claim 22 further comprising using the radial expansion force of the inflating fluid to widen the vessel lumen.
28. (Withdrawn) The method of claim 22 further comprising using non elastic web reinforcement attachments connecting the two walls of the graft to retain a desired shape and dimension of the graft after inflation with fluid.
29. (Withdrawn) The method of claim 28 further comprising varying the dimensions of the web reinforcement to create a corrugated outer surface on the outer wall of the graft after fluid inflation.
30. (Withdrawn) The method of claim 29 further comprising using the corrugated outer surface to facilitate the retention of the graft at a desired location within the vessel lumen after withdrawal of the catheter.
31. (Withdrawn) The method of claim 22 further comprising treating cerebral aneurysm.
32. (Withdrawn) The method of claim 22 further comprising treating cerebral atherosclerosis.
33. (Previously presented) A method of treating cerebral aneurysm comprising the steps of:
 - a. Selecting a graft having an inflated diameter compatible with an un-diseased body lumen and a length greater than the diseased portion of said cerebral vessel lumen,

- b. inserting a flexible two walled graft of non-compliant material within the tortuous, narrow or stenotic cerebral blood vessels utilizing a catheter having a fluid conveying component and where the graft further comprises
 - (i) two walls fluid sealed at each end of the graft and forming fluid chambers between the walls where said fluid chambers are bordered by at least one fused junction;
 - (ii) a plurality of inelastic web reinforcements oriented in a substantially radial direction within the fluid chambers and said web reinforcements are attached to the two walls;
 - (iii) at least one fused juncture wherein each fused juncture forms a circumference with a fixed diameter around the graft and wherein the fused juncture is not subject to inflation pressure and where the graft can bend without kinking or deforming;
 - (iv) a controllable valve accessing the fluid chambers between the walls of the graft and attachable to the fluid conveying component of the catheter;
- c. maneuvering the graft to a selected location within the cerebral blood vessel lumen proximate to the aneurysm;
- d. inserting fluid through a controllable valve within the graft into the fluid chambers between the two walls of the graft;
- e. continuing the addition of fluid to deploy the graft in a radial direction sufficient that an outer wall of the graft contacts an undiseased portion of the cerebral vessel lumen ~~the vessel wall~~ and a lumen is opened within the graft in communication with the cerebral vessel lumen;
- f. continuing the addition of fluid to cause the graft wall to stiffen and isolate the aneurysm from the vessel lumen;
- g. withdrawing the catheter; and
- h. continuing use of the stiffened graft to reinforce the vessel wall, isolate the aneurysm and maintain the graft lumen in communication with the vessel lumen.

34. (Withdrawn) The method of claim 33 further comprising using a graft comprised of substantially non-elastic materials and of a selected inflated shape and dimension compatible with the architecture of the tortuous, narrow and stenotic cerebral vessel.
35. (Withdrawn) The method of claim 34 further comprising a non linear shaped graft selected for compatibility with the shape and dimension of the vessel lumen to be treated and orienting the graft to the vessel shape prior to the addition of fluid.
36. (Withdrawn) The method of claim 34 further comprising using a non linear shaped graft selected and dimensioned for compatibility with the vessel lumen to be treated and orienting the graft to the vessel shape prior to the completion of fluid addition.
37. (Currently amended) The method of claim 34 33 further comprising inserting a graft containing at least one fenestration and orienting the fenestration to a branch of the vessel lumen.
38. (Currently amended) A method of treating cerebral atherosclerosis comprising the steps of:
- a. selecting a graft having a predetermined size and shape including side fenestrations;
 - b. inserting through the lumen of a tortuous, narrow or stenotic cerebral blood vessel[[s]] with a flexible two walled graft of non-compliant material utilizing a catheter having a fluid conveying component and where the graft further comprises
 - (ii) two walls a first outer wall and a second inner wall fluid sealed at each end of the graft and forming a fluid chamber between the walls;
 - (iii) one or more fused junctures of the inner wall and the outer wall wherein each fused juncture forms a circumference with a fixed diameter around the graft, wherein the graft can bend without kinking or distorting and the fused juncture is not subject to fluid pressure that are each configured as a band around the circumference of the graft and the fused junctures that create fluid impermeable seals and fluid communicating passages within resulting fluid chambers between the first and second walls;

- (iv) a plurality of inelastic separate narrow web reinforcements oriented in a substantially radial direction within the fluid chambers and attached to the first and second two walls;
 - (iii) a controllable valve accessing the fluid chambers between the walls of the graft and attachable to the fluid conveying component of the catheter;
 - c. maneuvering the graft into an area of atherosclerosis within the vessel lumen;
 - d. inserting fluid through a controllable valve within the graft into the fluid chambers between the two walls of the graft;
 - e. continuing the addition of fluid to deploy the graft in a radial direction sufficient that the graft achieves a pre-selected shape without distortion and the an-outer wall of the graft contacts the vessel wall and the inner diameter of the vessel lumen is expanded and a smooth inner wall lumen is opened within the graft in communication with the vessel lumen;
 - f. continuing the addition of fluid to cause the graft wall to stiffen and the graft lumen expand to a selected diameter trapping residue or plaque between the graft and vessel wall;
 - g. withdrawing the catheter; and
 - h. continuing use of the stiffened graft to reinforce the vessel wall, maintain the expanded vessel lumen and maintain the graft lumen in communication with the vessel lumen.
39. (Currently amended) ~~The method of claim 38 further comprising using a graft comprised of substantially non elastic materials and of a selected inflated shape and dimension. The method of claim 38 further comprising a tubular shaped graft containing a side fenestration at a selected location to allow deployment across bifurcating blood vessels.~~
40. (Withdrawn) The method of claim 39 further comprising using a non linear shaped graft selected for compatibility with the shape and dimension of the vessel lumen to be treated and orienting the graft to the vessel shape prior to the addition of fluid.
- 41 (Withdrawn) The method of claim 39 further comprising using a non linear shaped graft selected for compatibility with the shape and dimension of the vessel lumen to

be treated and orienting the graft to the vessel shape prior to the completion of fluid addition.

42. (Currently amended) A cerebral graft shaped for passage through and placement in the tortuous, narrow or stenotic cerebral circulatory system comprising:

- a. a first hollow flexible non-compliant component having an open first proximal end and [[a]] an open second distal end and forming an outer wall of a graft;
- b. a second hollow flexible non-compliant component having a first open proximal end and a second open distal end and forming an inner wall of the graft;
- c. a fluid impermeable seal joining the first ends of the first and second components and a fluid impermeable seal joining the second ends of the first and second components forming a two walled lumen;
- d. the first outer wall of the graft has an uneven surface and the second inner wall has a smooth surface;
- e. at least one fused juncture of the outer and inner walls containing a fluid passageway wherein said juncture forms a non expanding circumference around the graft allowing the lumen to bend without kinking or distortion at the fused juncture;
- f. a valve to convey fluid through the graft wall into an fluid chambers between circumferentially oriented fused junctures and the sealed ends of the outer wall and inner wall of the lumen to inflate the graft to a pre-selected shape without distortion;
- g. a plurality of flexible non-elastic web reinforcements within the fluid chambers and attached to the outer wall and inner wall wherein the length of the web reinforcement tapers proximate to the fused juncture and further comprising the outer graft wall has an uneven surface and the inner graft wall has a smooth surface;
- h. the addition of fluid into the fluid chambers to expand a vessel lumen.

Claim 43 and 44 are cancelled.

45. (Withdrawn) The graft of claim 42 wherein the graft is of a pre-selected inflatable dimension and shape.

46.(Currently amended) The graft of claim 42 wherein the connectors web reinforcements are of varying length to cause the outer wall surface to be corrugated to prevent the drag force of the flowing blood through the graft from displacing the graft and to provide sites for neointimal growth.

47.(Currently amended) The graft of claim 42 wherein the connectors web reinforcements are of varying length to cause the outer wall surface to be dimpled to prevent the drag force of the flowing blood through the graft from displacing the graft and to provide sites for neointimal growth.

Claims 48 and 49 are cancelled

50.(Withdrawn) The graft of claim 42 wherein the inflated outer diameter is less than 10 mm.

51.(Withdrawn) The graft of claim 42 wherein the fluid inflating the graft is a curable composition.

52.(Withdrawn) The graft of claim 51 is curable composition is selected from the group consisting of a monomer, a liquid pre-polymer or an un-linked polymer.

53.(Cancelled)

54.(Cancelled)

55.(Withdrawn) The graft of claim 42 wherein the outer diameter of the distal end is different from the outer diameter of the proximal end.

56.(Withdrawn) A non-linear tubular shaped graft comprising:

- a. a first hollow cylindrically shaped flexible component having a open first proximal end and a open second distal end and forming an outer wall of the graft;
- b. a second hollow cylindrically shaped flexible component having a open first proximal end and a open second distal end and forming an inner wall of the graft;
- c. a fluid impermeable seal joining the first ends of the first and second components and a fluid impermeable seal joining the second ends of the first and second components forming a two walled lumen;
- d. a valve to convey fluid through the graft wall into an fluid chambers between the sealed ends of the outer wall and inner wall to inflate the graft; and

- e. a plurality of web reinforcements within the fluid chambers and attached to the outer wall and inner wall.
57. (Withdrawn) The graft of claim 56 further comprising one or more junctures of the first and second wall between the sealed first and second ends variably sized to create a nonlinear longitudinal axis of the graft after inflation with fluid.